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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/523,917	02/07/2005	Ronald Garwood Grey	4623-050025	1943

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EXAMINER

WEST, PAUL M

ART UNIT PAPER NUMBER

2856

DATE MAILED: 08/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/523,917

Applicant(s)

GREY ET AL.

Examiner

Paul M. West

Art Unit

2856

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 May 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claims 2-4, 11-13, 15-17 and 24-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
2. As to claims 2 and 15, if the monotonic group delay function describes a frequency, how can it be compared with the acquisition period which is a unit of time?
3. As to claims 4 and 17, the term terfenite is not a commonly known term and therefore renders the claim indefinite.
4. As to claims 11, 12, 24, and 25, the claims are not clear as to what aspect of the signal is ramped up, i.e. is it ramping up the amplitude, frequency, etc.?
5. As to claims 13 and 26, it is unclear what is meant by "multiplying the signal." What is the signal being multiplied by, or is it just generally increasing? What aspect of the signal is growing or attenuating, i.e. is it amplitude, frequency, etc.?

### ***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Art Unit: 2856

7. Claims 1, 5-10, 14, and 18-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Field.

8. As to claim 1, Field teaches a rheometer comprising: a driver 120 for applying an alternating movement to a surface of a sample 150 for causing an alternating movement of the sample; a force measuring device 160 for providing a signal indicative of the reaction force exerted by the sample on the driver; a displacement measuring device 170,180 for providing a signal indicative of the alternating movement of the sample 150; a processor 200 for receiving the force signal and the movement signal to determine a rheological property of the sample; and a signal generator 111 for supplying to the driver a frequency sweep signal having a group delay which is monotonic (Col. 6, lines 2-5). Note that the signal generator disclosed by Field is capable of supplying many different types of waveforms, and the intended use of the signal generator of Applicant's invention does not structurally distinguish it from that of Field's apparatus.

9. As to claim 5, Field teaches the apparatus including a sample support comprising a top plate 130 and a bottom plate 140 which define a space for receiving the sample 150.

10. As to claim 6, the displacement measuring device 170,180 is a transducer.

11. As to claim 7, the force measuring device 160 is a load cell.

12. As to claim 8, the processor includes an analog to digital converter 176,191 for converting the signal from the load cell and the displacement measuring means to a digital signal.

13. As to claims 9 and 10, the processor is for determining the fourier transform of both the force signal and the movement signal and the ratio of the force fourier transform  $F(\omega)$  to the movement fourier transform  $H(\omega)$ , and the complex modulus is

computed with the formula:  $G^*(\omega) = \frac{h^3}{3\pi a^4} \times \frac{F(\omega)}{H(\omega)}$ , where  $a$  is the radius of one of the

plates and  $h$  is the average separation of the plates (Col. 2, lines 13-28).

14. As to claim 14, Field teaches a method of determining a rheological property of a sample, comprising: applying by a driver 120 and alternating movement to a surface of the sample 150 for causing alternating movement of the sample; measuring a force signal with force measuring means 160 indicative of a reaction force exerted by the sample; measuring a signal indicative of the alternating movement of the sample 150 by means of transducer 170,180; processing the force signal and the movement signal with processor 200 to determine the rheological property of the sample 150; and supplying the driver with a frequency sweep signal having a group delay which is monotonic (Col. 6, lines 2-5).

15. As to claim 18, Field teaches the method including supporting the sample between a top plate 130 and a bottom plate 140 which define a space for receiving the sample 150.

16. As to claim 19, the displacement is measured by a transducer 170,180.

17. As to claim 20, the force is measured by a load cell 160,175.

18. As to claim 21, the processing in includes using analog to digital converters 191,176 to convert the force signal and displacement signals to digital signals.

Art Unit: 2856

19. As to claims 22 and 23, the processing further includes determining the fourier transform of both the force signal and the movement signal and the ratio of the force fourier transform  $F(\omega)$  to the movement fourier transform  $H(\omega)$ , and calculating the

complex modulus with the formula:  $G^*(\omega) = \frac{h^3}{3\pi a^4} \times \frac{F(\omega)}{H(\omega)}$ , where  $a$  is the radius of one

of the plates and  $h$  is the average separation of the plates (Col. 2, lines 13-28).

***Claim Rejections - 35 USC § 103***

20. Claims 3, 11, 16, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Field.

21. As to claims 3 and 16, Field is silent as to the size of the crest factors of the frequency sweep signal, however it would have been obvious to one of ordinary skill in the art to use a signal with small crest factors because it is well-known in the art that small crest factors lead to less impacting and therefore reduce bearing wear in vibrating machinery, and signals with small crest factors are more accurately used with fourier transforms.

22. As to claims 11 and 24, Field teaches the frequency sweep signal consisting of reversing ramps (Col. 6, lines 2-5) but does not specifically say the signal is ramped up at the beginning and ramped down at the end. However, it would have been obvious to one of ordinary skill in the art to ramp the signal up at the beginning and down at the end because the signal must start from zero initially and therefore must be ramped up in the beginning to reach any higher values.

***Allowable Subject Matter***

23. Claims 12 and 25 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

24. Applicant's arguments filed 24 May 2006 have been fully considered but they are not persuasive.

25. Regarding claims 1 and 2, Applicant has stated in the remarks that a monotonic group delay function is a function of the frequency of a signal, however in claim 2 this function is compared with the acquisition period, which Applicant has stated is a period of time.

26. Regarding Applicant's claim that the term "terfenite" is clear from the specification and drawings as originally filed, it is maintained that the term is not known in the art and the chemical formula is not disclosed in the specification as originally filed.

27. Regarding claims 11-13 and 24-26, Applicant has specified that in claims 11, 12, 24, and 25, the phrase "ramped up" refers to the frequency of the signal, however this is not stated and is not clear from language in the claims. Applicant has further specified that in claims 13 and 26, the phrase "multiplying the signal" refers to multiplication of the amplitude of the signal, however this is not clear from the language of the claims.

Furthermore, it is confusing that the word "signal" refers to the frequency of the signal in

Art Unit: 2856

some claims, while it refers to the amplitude of the signal in other claims. It should also be noted that Applicant has pointed to the specification at page 18, line 19 to page 19, line 13 to explain what is meant by ramping up and multiplying the signal, and in this passage the ramping functions stated in claims 12 and 25 are applied to displacement functions. While displacement would refer to the amplitude of the signal, it is not clear from the passage whether these ramp functions are meant to affect the amplitude or the frequency of the signal.

28. Regarding claims 1 and 14, Applicant has argued that the Field reference does not teach using a monotonic group delay function, however Field does teach using a ramp function for the vibration signal which is considered to be equivalent to a monotonic group delay. Further, it should be noted that in claim 1, the signal generator is claimed, but its method of use does not structurally distinguish it from other signal generators that are capable of performing the same functions.

### ***Conclusion***

29. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any



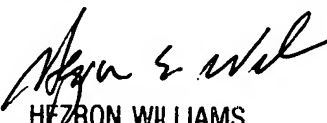
Art Unit: 2856

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul M. West whose telephone number is (571) 272-8590. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
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